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Development of rotating graphite carbon disk stripper

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The rotating disk stripper[1] has been one of the essential elements in RIKEN RIBF for providing a stable high-intensity uranium (U) beam. This rotating stripper was developed on the assumption that a large carbon disk (C-disk) was applied as the stripping material to reduce a heat load of the passing beam by increasing the beam-irradiated area. However, no C-disk was applicable to the stripper at that time, because of its poor surface flatness and unexpected low density. Since 2012, The availability and intensity of the provided U beam have greatly enhanced, by adopting beryllium (Be) as the rotating disk material[2]. Nevertheless, since the U beam intensity incident on the stripper has increased because of the upgraded upstream instruments, the thermal stress by the beam load on the stripper deformed the Be-disk even in a short time operation, which caused fluctuation of the provided U beam intensity. Therefore, we reconsidered the possibility for using C-disk again, and tested a high-density highly oriented graphite (HDHOG) sheet[3] as a stripper disk. It was found that the HDHOG sheet can be applied to the stripper with better stripping efficiency and higher transmission value than Be-disk. Also, the lifetime of the HDHOG disk seems to be much longer than Be. The problem in the final stripping section has been solved and the recent results will be represented.

References

[1] H. Ryuto et al.: Nucl. Instr. and Meth. A 569 (2008) 697.
[2] H. Hasebe et al.: J Radioanal Nucl Chem (2015) 305:825–829
[3] A. Tatami et al.: Presentation will be held in this conference entitled “Preparation of multi-layer graphene sheets and their applications for particle accelerators”.

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